Exemption No. 6886

UNITED STATES OF AMERICA
DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
RENTON, WASHINGTON 98055-4056

In the matter of the petition of

Boeing Commercial Airplane Group

for an exemption from § 25.1435(b)(1) of Title 14, Code of Federal Regulations

Regulatory Docket No. 29348

GRANT OF EXEMPTION

By letter of September 3, 1998, Mr. Norman I. Lee, III, Manager, Certification Programs, Boeing Commercial Airplane Group, P.O. Box 3707, Seattle, WA, 98124-2207, petitioned for a partial exemption from the static pressure test requirements of § 25.1435(b)(1) of Title 14, Code of Federal Regulations (14 CFR). The proposed exemption, if granted, would permit a range of motion test to be conducted at 3400 psig for the hydraulic system on the Boeing Model 767-400ER airplane. By letter of November 4, 1998, Mr. Lee provided clarifying information in support of the same petition for exemption.

The petitioner requests relief from the following regulations:

> Section 25.1435(b)(1) states that a complete hydraulic system must be static tested to show that it can withstand 1.5 times the design operating pressure without a deformation of any part of the system that would prevent it from performing its intended function. Clearance between structural members and hydraulic system elements must be adequate, and there must be no permanent detrimental deformation. For the purpose of this test, the pressure relief valve may be made inoperable to permit application of the required pressure.

ANM-98-042-E

The petitioner's supportive information is as follows:

In place of the static test (4500 psig), Boeing proposes to demonstrate compliance by a combination of testing to 3400 + 0/-100 psig, the lowest allowable reseat pressure for the system pressure relief valve, and similarity to the Boeing Model 767-200, which was tested to 4500 psig. Boeing states that proposed testing be conducted only for those installations where:

"1. The installation is not present in the 767-200, or

"2. Hydraulic line diameters are increased from the 767-200, or

"3. A change significantly reduces the clearance between any installation and structure, or moving object, relative to 767-200 clearances, or

"4. The clamping method, clamp spacing or clamp orientation is significantly changed from the 767-200."

Boeing further states that compliance by similarity applies to those installations where:

"1. Tube installation is unchanged from the 767-200, or

"2. Tube installation is added to accommodate a stretched section of the fuselage, employs standard installation techniques, and does not reduce the separation relative to the surrounding structure, or

"3. Tube installation is modified for very minor re-routing in uncongested areas."

Boeing agrees to furnish for the FAA's review and approval the above stated lists before conducting the tests.

Boeing asserts that the granting of this exemption with respect to testing a complete hydraulic system at 1.5 times operating pressure is in the public interest because the proposed method of demonstrating compliance will provide an equal or greater level of safety as well as eliminate inefficiencies and added cost. Boeing provides the following factors to substantiate their position.

"1. The purpose of the test is to check a complete hydraulic system and show adequate separation between the hydraulic system elements and adjacent elements, including structure, such that there will be no permanent detrimental deformation that would prevent the hydraulic system from performing its intended function. If the test were to be

performed at 4500 psig, components would have to be disconnected or blocked off from the 4500 psig pressure source to prevent structural overload from the actuators. The deactivation of these components would render the hydraulic system out of configuration as well as add inefficiencies and cost.

"2. Tubing deflections due to pressurization are minimal and the differences in deflections when pressurized to 3400 psig versus 4500 psig are negligible. Substantiation for this is provided in the attached hydraulic tubing deflection test results.

"3. Compliance with § 25.1435(b)(1) by similarity for essentially straight tubing runs added to the stretched body sections is valid because the new tubing installation will be virtually identical to the existing tubing runs through the body. The existing 767-200 tubing runs through the body were shown to comply with § 25.1435(b)(1) by means of a 4500 psig test.

"4. The proposed exemption has been granted for several comparable transport airplanes (Exemption 6086 for 737-700; Exemption 6504 for 777-300, and Exemption 6577 for the 757-300."

In view of the substantiating factors detailed above, Boeing asserts that its proposed method of proof pressure testing to 3400 psig of certain new areas of the hydraulic system of the Boeing Model 767-400ER airplane and a similarity (to the Boeing Model 767-200) analysis for the remainder of the hydraulic system is in the public interest. The proposed method of compliance provides the same assurance of safe operation as the proof pressure test to 4500 psig, with the benefit of improved efficiency and cost. Boeing therefore petitions the FAA to grant the subject exemption.

A summary of the petition was published in the Federal Register on December 16, 1998 (63 FR 69356). No comments were received.

The Federal Aviation Administration's analysis/summary is as follows:

The FAA has carefully considered the information provided by the petitioner, and has determined that there is sufficient merit to warrant a grant of exemption.

Previously Granted Partial Exemptions for Boeing Models 737-700, 777-300, and 757-300

The FAA concurs that the basis for the partial exemptions granted for Boeing Models 737-700, 777-300, and 757-300, and the substantiating factors including the deflection test comparisons at 3000 and 4500 psig, also apply to the Boeing Model 767-400ER hydraulic system.

Boeing Model 767-400ER vs Boeing Model 767-200 Hydraulic System Similarity

The FAA concurs that the Boeing Model 767-200 proof pressure test conducted at 4500 psig to demonstrate compliance with § 25.1435(b)(1) is still valid for the unchanged portions and tubing runs on the Model 767-400ER. Boeing proposes to develop a plan listing the specific areas of the Model 767-400ER hydraulic system to be tested using the stated criteria and to have the FAA review and approve the proposed plan.

In consideration of the foregoing, I find that a grant of exemption is in the public interest. Therefore, pursuant to the authority contained in 49 U.S.C. §§ 40113 and 44701, delegated to me by the Administrator (14 CFR § 11.53), the Boeing Commercial Airplane Group is granted an exemption from 14 CFR § 25.1435(b)(1) to permit Boeing to conduct a 3400 psig test of the modified portions of the hydraulic system identified in the proposed plan. Boeing is to submit a proposed plan to the cognizant FAA aircraft certification office for approval. In addition, Boeing is to document all test results pertinent to this exemption in a report and to provide a copy to this office.

Issued in Renton, Washington, on April 8, 1999.

/s/ John J. Hickey
John J. Hickey
Acting Manager
Transport Airplane Directorate
Aircraft Certification Service, ANM-100